

Munich Cancer Registry



- ▶ Incidence and Mortality
- ▶ Selection Matrix
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ICD-10 C19, C20: Rectal cancer

Survival

Year of diagnosis	1988-1997	1998-2016
Patients	3,908	17,919
Diseases	3,910	17,939
Cases evaluated	3,516	14,404
Creation date	08/22/2018	
Export date	08/09/2018	
Population	4.81 m	



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<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/surv/sC1920E-ICD-10-C19-C20-Rectal-cancer-survival.pdf>

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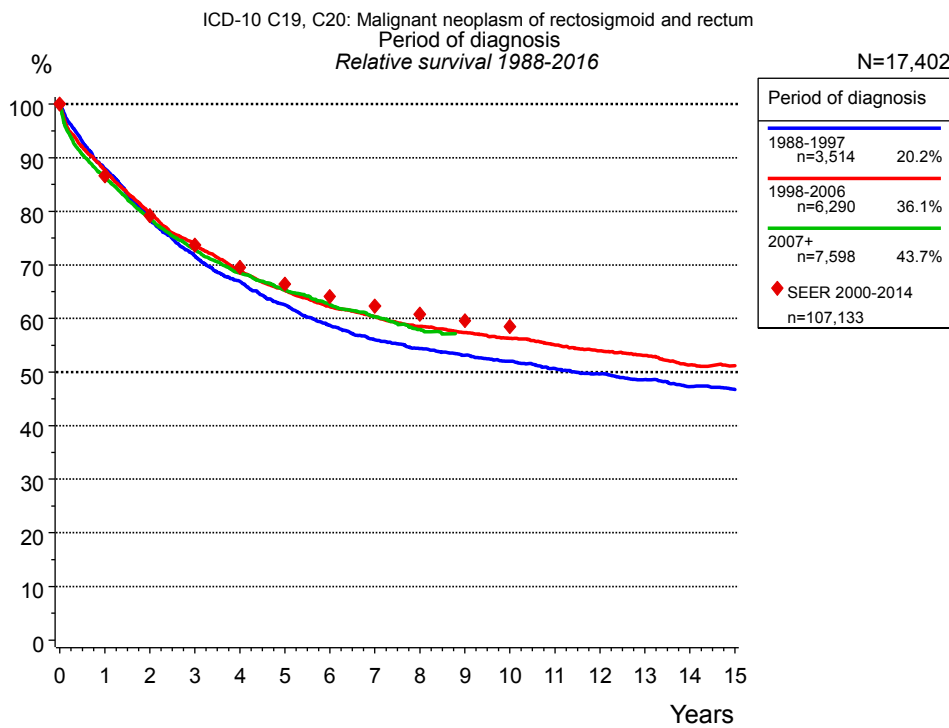


Figure 1a. Relative survival of patients with rectal cancer by period of diagnosis. Included in the evaluation are 17,402 cases diagnosed between 1988 and 2016.

The survival results of the SEER program (Surveillance, Epidemiology, and End Results) of the American National Cancer Institute (NCI) are summarized as the period of diagnosis from 2000 to 2014, and are represented by colored diamonds in order to facilitate comparisons between MCR and SEER.

The presented survival curves are derived from clinical records with valid follow-up informations, which means that death certificate cases (DCO) cases are omitted from the analysis. With this one restriction, the MCR has provided population-based statistics since 1998, collecting data on all cancer cases in the region of southern Bavaria. Historical data of previous time periods can be heavily selected, therefore, univariate survival comparisons of the presented time periods must be carefully considered. Nonetheless, all calculable survival curves are depicted to facilitate the comparison of long time follow-up analyses of relative survival between particular cancers.

Years	Period of diagnosis					
	1988-1997 n=3,514		1998-2006 n=6,290		2007+ n=7,598	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	85.2	88.0	84.9	87.7	83.8	86.4
2	73.7	78.5	74.8	79.5	74.4	78.8
3	65.3	71.7	67.6	73.8	66.9	72.8
4	59.1	66.9	61.3	68.8	61.2	68.5
5	53.6	62.6	56.5	65.2	56.7	65.3
6	48.7	58.7	52.4	62.2	52.8	62.5
7	45.1	56.0	49.4	60.4	49.4	60.3
8	42.5	54.4	46.5	58.5	46.2	57.9
9	40.1	53.1	44.2	57.3		
10	38.1	52.0	42.1	56.3		
11	36.0	50.6	39.9	55.1		
12	34.1	49.7	37.9	54.0		
13	32.3	48.6	36.1	53.1		
14	30.4	47.3	33.7	51.3		
15	29.1	46.8	32.5	51.2		

Table 1b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by period of diagnosis for period 1988-2016 (N=17,402).

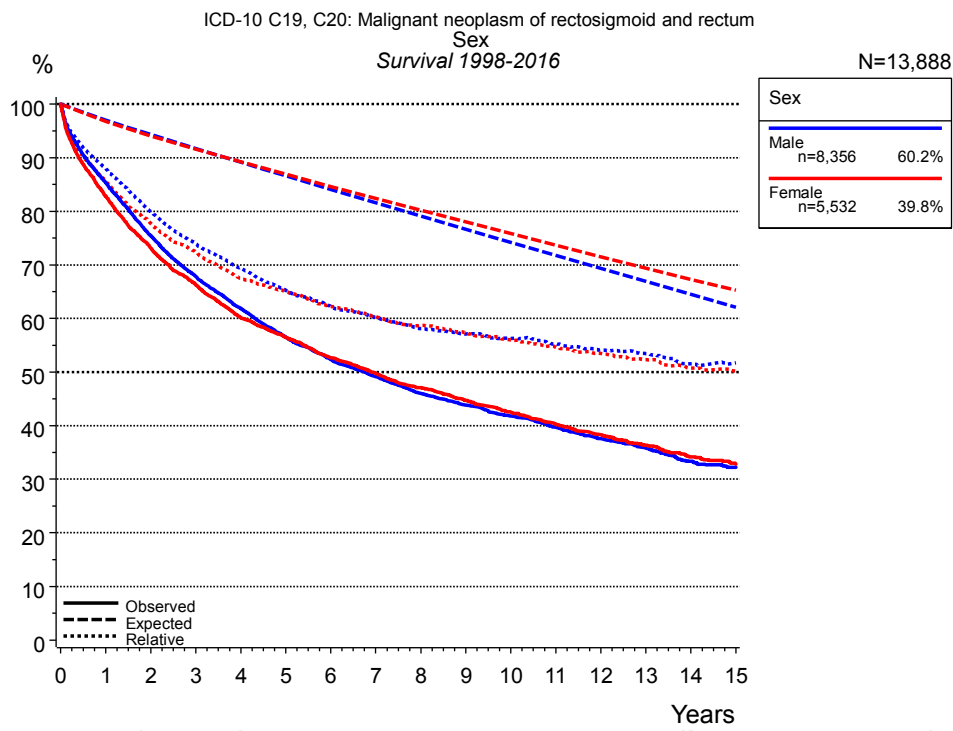


Figure 2a. Survival of patients with rectal cancer by sex. Included in the evaluation are 13,888 cases diagnosed between 1998 and 2016.

Years	Sex			
	Male n=8,356		Female n=5,532	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	85.3	88.0	82.8	85.5
2	75.5	80.0	73.2	77.8
3	67.8	73.9	66.3	72.3
4	61.9	69.4	60.1	67.4
5	56.5	65.3	56.5	65.0
6	52.3	62.2	52.7	62.2
7	49.2	60.2	49.7	60.4
8	46.0	58.1	47.1	58.7
9	43.8	57.1	44.7	57.3
10	41.8	56.3	42.5	56.0
11	39.7	55.2	40.3	54.6
12	37.6	54.2	38.2	53.5
13	35.8	53.5	36.4	52.3
14	33.3	51.6	34.2	50.7
15	32.2	51.7	32.8	50.2

Table 2b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by sex for period 1998-2016 (N=13,888).

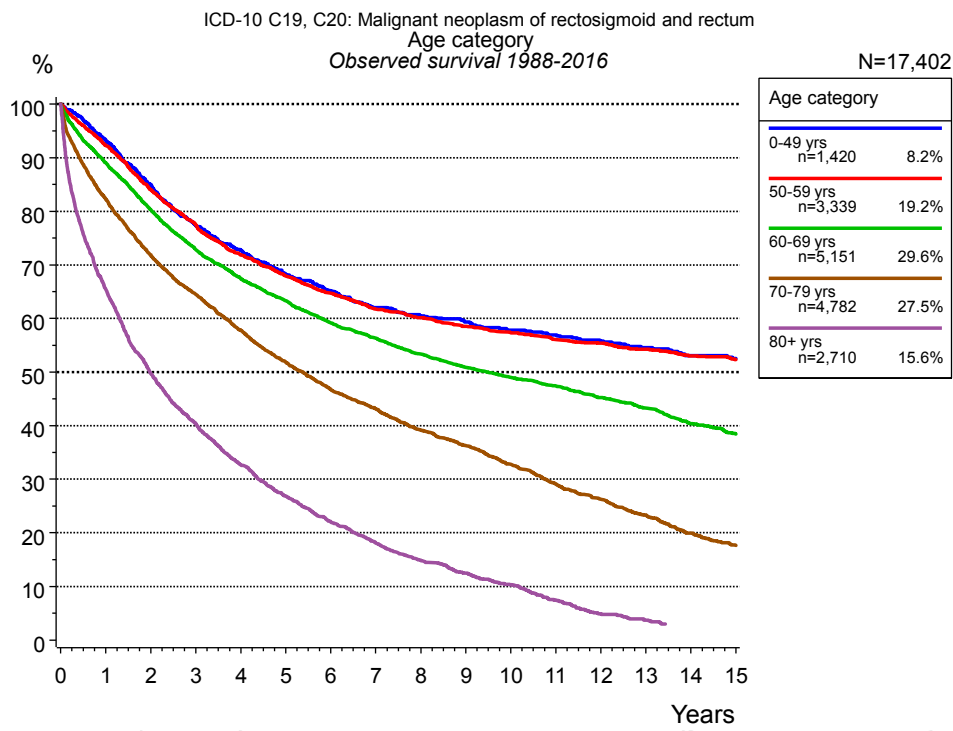


Figure 3a. Observed survival of patients with rectal cancer by age category. Included in the evaluation are 17,402 cases diagnosed between 1988 and 2016.

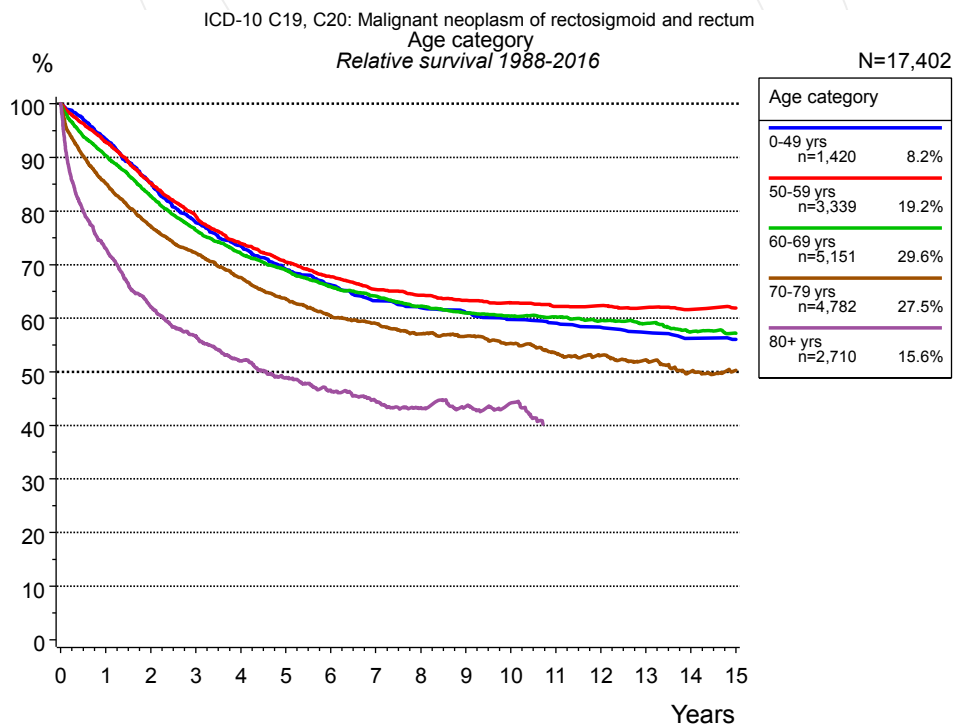


Figure 3b. Relative survival of patients with rectal cancer by age category. Included in the evaluation are 17,402 cases diagnosed between 1988 and 2016.

Years	Age category									
	0-49 yrs n=1,420		50-59 yrs n=3,339		60-69 yrs n=5,151		70-79 yrs n=4,782		80+ yrs n=2,710	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	93.2	93.4	92.3	92.9	89.0	90.4	82.3	85.2	65.5	73.0
2	85.0	85.3	84.0	85.1	80.3	82.8	71.8	77.2	49.9	62.2
3	77.3	77.8	77.5	79.1	72.9	76.4	64.5	72.1	40.4	56.6
4	72.8	73.5	71.9	73.9	67.5	72.0	57.8	67.6	32.7	52.0
5	68.2	69.1	67.9	70.5	63.3	69.0	51.9	63.6	26.9	48.9
6	65.1	66.2	64.6	67.7	59.2	65.9	46.7	60.4	22.0	46.4
7	62.0	63.3	61.7	65.3	56.3	64.1	43.1	59.0	18.1	44.5
8	60.5	62.0	60.1	64.3	53.4	62.2	39.2	57.1	14.9	43.3
9	59.3	61.1	58.6	63.3	50.9	60.9	36.3	56.6	12.5	43.5
10	57.8	59.8	57.3	62.8	49.0	60.4	32.8	55.3	10.4	44.1
11	56.9	59.1	56.1	62.2	47.4	60.3	29.1	53.5	7.5	39.6
12	55.8	58.3	55.4	62.3	45.3	59.5	26.2	53.0	4.9	32.7
13	54.6	57.3	54.3	62.0	43.2	59.0	23.3	52.3	3.7	32.2
14	53.1	56.2	53.0	61.6	40.4	57.5	19.9	50.0		
15	52.5	56.1	52.3	61.9	38.4	57.2	17.7	50.3		

Table 3c. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by age category for period 1988-2016 (N=17,402).

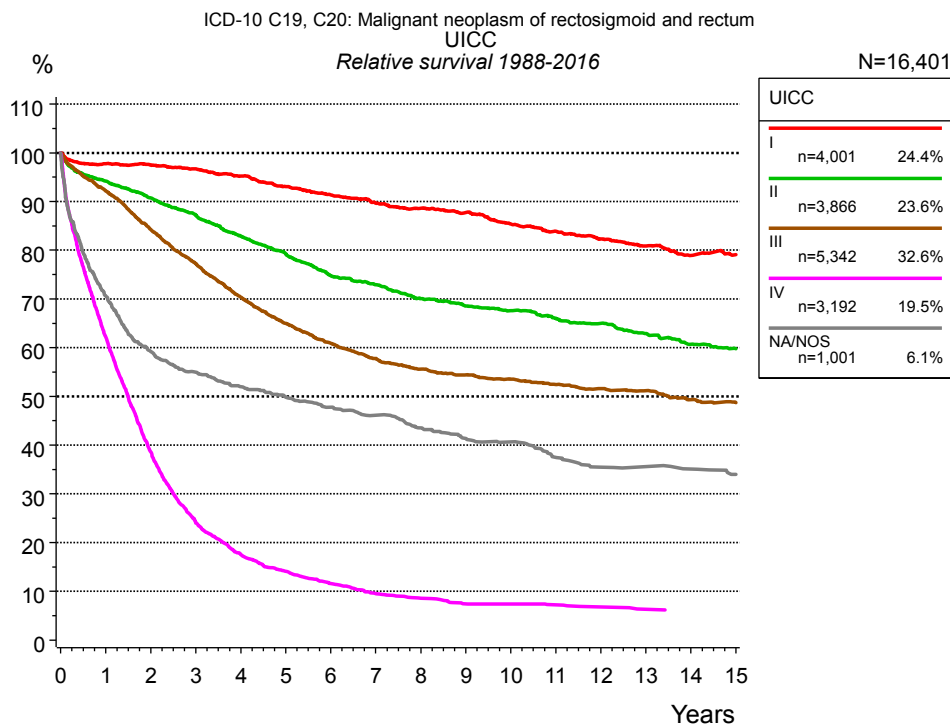


Figure 4a. Relative survival of patients with rectal cancer by UICC. For 16,515 of 17,402 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 16,401 cases an evaluable classification was established. The grey line represents the subgroup of 1,001 patients with missing values regarding UICC (5.8 % of 17,402 patients, the percent values of all other categories are related to n=16,401).

Years	UICC									
	I n=4,001		II n=3,866		III n=5,342		IV n=3,192		NA/NOS n=1,001	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	94.9	97.8	91.0	94.2	89.6	92.2	60.4	62.2	66.7	70.7
2	91.8	97.5	85.0	90.7	79.8	84.3	36.8	38.6	53.5	59.2
3	88.3	96.7	79.3	87.2	71.4	77.3	22.5	24.1	48.0	55.0
4	84.3	95.2	73.1	82.9	63.4	70.4	16.1	17.6	44.0	52.0
5	79.9	93.1	67.8	79.3	57.1	65.0	12.6	14.1	41.1	49.8
6	76.0	91.3	62.0	74.8	52.1	60.9	10.1	11.6	38.4	47.8
7	72.3	89.7	58.7	72.9	48.2	57.8	8.2	9.5	36.1	46.2
8	69.2	88.6	54.6	70.1	45.2	55.6	7.3	8.6	33.2	43.5
9	66.2	87.7	51.8	68.5	43.0	54.4	6.2	7.4	30.7	41.4
10	62.3	85.4	49.5	67.6	41.1	53.5	6.0	7.4	29.4	40.7
11	59.2	83.9	46.8	66.0	39.3	52.5	5.7	7.2	26.4	37.5
12	56.1	82.3	44.5	65.0	37.4	51.6	5.2	6.7	24.1	35.5
13	53.3	80.9	41.6	62.9	36.0	51.2	4.8	6.3	23.7	35.6
14	50.2	78.9	38.8	60.7	33.7	49.4			22.7	35.1
15	48.6	79.1	36.8	59.8	32.2	48.7			21.3	34.0

Table 4b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by UICC for period 1988-2016 (N=16,401).

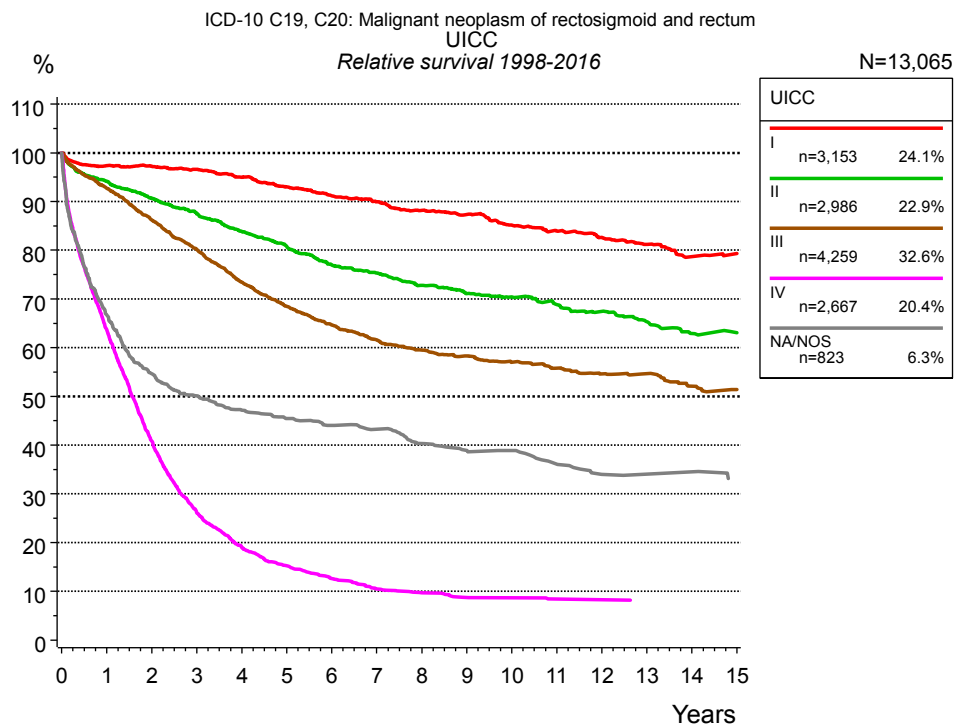


Figure 4c. Relative survival of patients with rectal cancer by UICC. For 13,155 of 13,888 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 13,065 cases an evaluable classification was established. The grey line represents the subgroup of 823 patients with missing values regarding UICC (5.9 % of 13,888 patients, the percent values of all other categories are related to n=13,065).

Years	UICC									
	I n=3,153		II n=2,986		III n=4,259		IV n=2,667		NA/NOS n=823	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	94.5	97.4	91.0	94.1	90.3	92.7	61.9	63.6	62.9	66.7
2	91.6	97.3	85.0	90.7	81.9	86.2	38.9	40.8	49.3	54.7
3	88.3	96.6	79.6	87.5	74.3	80.2	24.5	26.2	43.7	50.2
4	84.2	95.0	74.1	83.9	66.4	73.4	17.5	19.1	39.9	47.2
5	80.0	93.0	69.1	80.8	60.4	68.5	13.6	15.2	37.4	45.5
6	76.0	91.2	64.0	77.0	55.6	64.7	11.1	12.6	35.5	44.1
7	72.6	89.9	60.7	75.4	51.7	61.6	9.1	10.5	33.9	43.3
8	69.0	88.2	56.9	72.8	48.7	59.5	8.2	9.7	30.9	40.3
9	66.0	87.3	53.9	71.1	46.5	58.3	7.3	8.7	29.2	38.9
10	62.3	85.2	51.7	70.4	44.2	57.0	7.0	8.7	28.5	38.9
11	59.3	83.9	49.0	68.8	42.0	55.8	6.7	8.4	25.8	36.1
12	56.5	82.6	46.4	67.5	40.0	54.6	6.5	8.2	23.5	34.0
13	53.6	81.2	43.4	65.4	38.9	54.7			23.1	34.1
14	50.1	78.7	40.4	62.9	36.0	52.1			23.1	34.5
15	48.8	79.3	38.9	63.1	34.4	51.4				

Table 4d. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by UICC for period 1998-2016 (N=13,065).

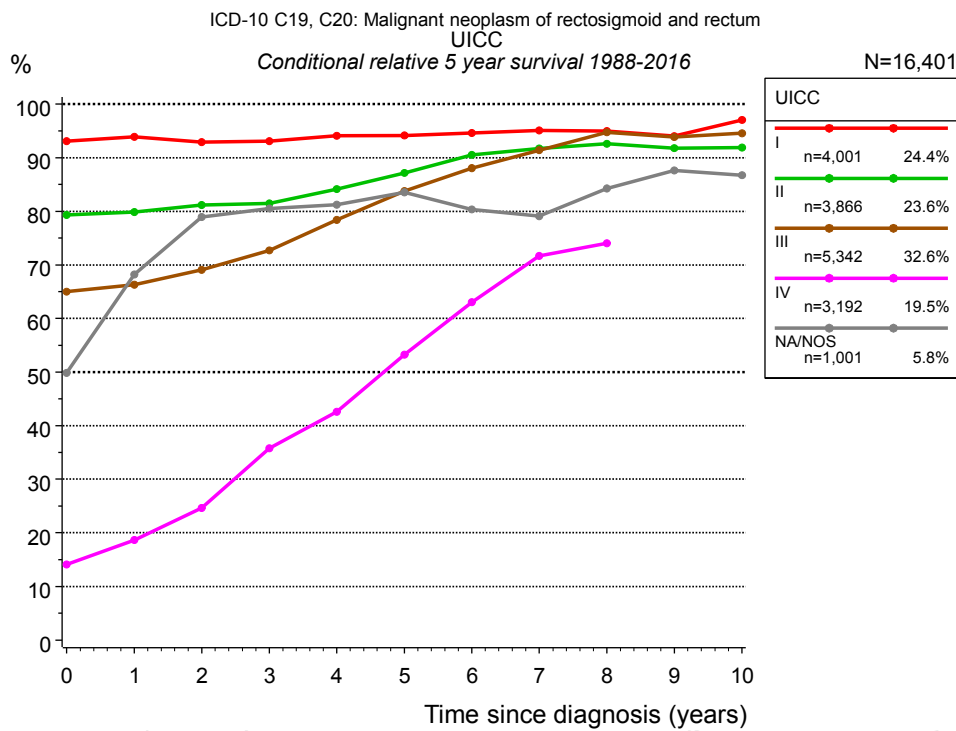


Figure 4e. Conditional relative 5-year survival of patients with rectal cancer by UICC. For 16,515 of 17,402 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 16,401 cases an evaluable classification was established. The grey line represents the subgroup of 1,001 patients with missing values regarding UICC (5.8 % of 17,402 patients, the percent values of all other categories are related to n=16,401).

Years	UICC									
	I		II		III		IV		NA/NOS	
	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs	n	Cond. surv. % 5 yrs
0	4,001	93.1	3,866	79.3	5,342	65.0	3,192	14.1	1,001	49.8
1	3,630	93.9	3,378	79.8	4,519	66.3	1,837	18.7	633	68.2
2	3,344	92.9	3,021	81.2	3,796	69.1	1,054	24.6	494	78.9
3	3,067	93.1	2,670	81.5	3,173	72.7	599	35.8	426	80.5
4	2,782	94.1	2,340	84.1	2,605	78.4	385	42.6	380	81.2
5	2,488	94.1	2,048	87.1	2,142	83.8	272	53.2	334	83.5
6	2,215	94.6	1,749	90.6	1,798	88.0	186	63.0	300	80.3
7	1,962	95.1	1,534	91.7	1,495	91.5	133	71.7	268	79.1
8	1,752	95.0	1,318	92.6	1,240	94.8	106	74.1	231	84.3
9	1,532	94.0	1,140	91.8	1,017	93.8			194	87.7
10	1,322	97.0	982	91.9	866	94.6			163	86.8

Table 4f. Conditional relative 5-year survival of patients with rectal cancer by UICC for period 1988-2016 (N=16,401).

Conditional relative survival rates refer to the relative survival probability, in this case for 5 years after cancer diagnosis, compared to the age- and sex-matched population (=100 %) under the condition of being alive for a certain time period (x-axis in Figure 4c). The results illustrate to what extent the cancer induced mortality of particular subgroups declines in the subsequent years after detection of the malignancy. For instance, according to the presented survival statistics, patients in the subgroup UICC="I", who are alive at least 3 years after cancer diagnosis, the conditional relative 5-year survival rate is 93.1% (n=3,067).

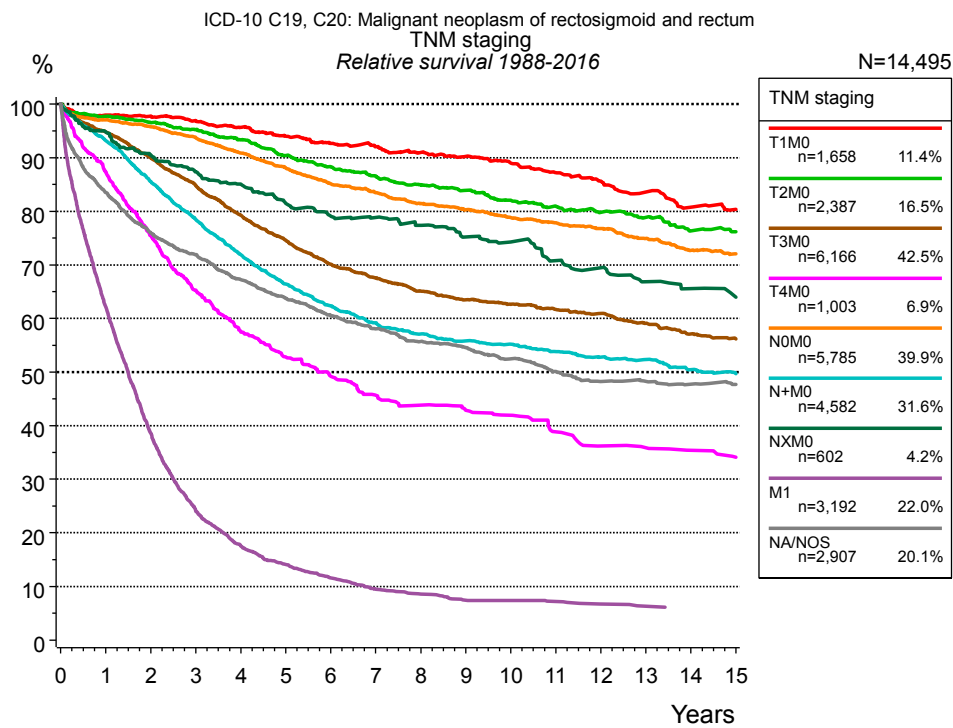


Figure 4g. Relative survival of patients with rectal cancer by TNM staging. For 16,515 of 17,402 cases diagnosed between 1988 and 2016 valid data could be obtained for this item. For a total of 14,495 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 2,907 patients with missing values regarding TNM staging (16.7 % of 17,402 patients, the percent values of all other categories are related to n=14,495).

Years	TNM staging													
	T1M0 n=1,658		T2M0 n=2,387		T3M0 n=6,166		T4M0 n=1,003		NOM0 n=5,785		N+M0 n=4,582		NXM0 n=602	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	95.5	97.9	94.8	97.7	92.0	94.8	84.6	87.3	94.2	97.1	90.7	93.2	91.9	94.8
2	93.0	97.7	90.8	96.5	85.0	90.0	71.0	75.5	90.3	95.8	81.2	85.5	85.1	90.5
3	89.7	96.9	87.0	95.2	77.9	84.8	59.9	65.3	85.8	93.7	72.7	78.5	79.7	87.4
4	86.2	95.7	82.7	93.3	70.9	79.3	51.4	57.5	80.7	90.9	64.9	71.9	75.6	85.1
5	82.4	94.0	77.7	90.4	64.8	74.6	46.1	52.8	76.0	88.1	58.5	66.4	70.3	81.5
6	79.0	92.7	73.6	88.3	59.2	70.1	41.9	49.2	71.2	85.1	53.6	62.3	66.5	79.1
7	76.2	92.0	70.0	86.6	55.5	67.6	37.8	45.7	67.7	83.5	49.6	59.2	64.5	78.8
8	73.1	91.0	66.5	84.9	52.0	65.1	35.5	43.8	64.0	81.4	46.6	57.1	61.5	77.4
9	70.2	90.2	63.7	83.9	49.2	63.4	33.7	42.9	61.1	80.3	44.4	55.8	57.9	75.2
10	67.1	89.0	60.3	82.0	47.1	62.6	32.3	41.9	58.1	78.8	42.6	55.1	55.4	74.3
11	63.6	87.2	57.6	80.9	45.0	61.7	29.1	38.8	55.5	77.8	40.5	53.8	51.3	70.8
12	60.5	85.6	54.9	79.8	43.0	60.9	26.4	36.2	53.0	76.8	38.6	52.8	48.9	69.5
13	57.0	83.5	52.5	78.9	40.3	59.1	25.7	35.9	49.9	74.9	37.1	52.3	45.3	66.9
14	53.4	80.8	49.1	76.3	37.6	57.1	24.5	35.4	46.7	72.7	34.8	50.4	43.3	65.6
15	51.4	80.3	47.4	76.2	35.7	56.2	23.1	34.1	44.7	72.1	33.2	49.7	40.7	64.0

<i>cont'd</i>	TNM staging			
	M1		NA/NOS	
	n=3,192		n=2,907	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	60.4	62.2	80.0	83.5
2	36.8	38.6	70.1	76.0
3	22.5	24.1	64.2	71.9
4	16.1	17.6	58.1	67.2
5	12.6	14.1	53.4	63.8
6	10.1	11.6	49.0	60.5
7	8.2	9.5	45.5	58.0
8	7.3	8.6	42.4	55.7
9	6.2	7.4	40.2	54.6
10	6.0	7.4	37.4	52.5
11	5.7	7.2	34.6	50.1
12	5.2	6.7	32.2	48.2
13	4.8	6.3	31.3	48.3
14			29.9	47.7
15			28.9	47.7

Table 4h. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by TNM staging for period 1988-2016 (N=14,495).

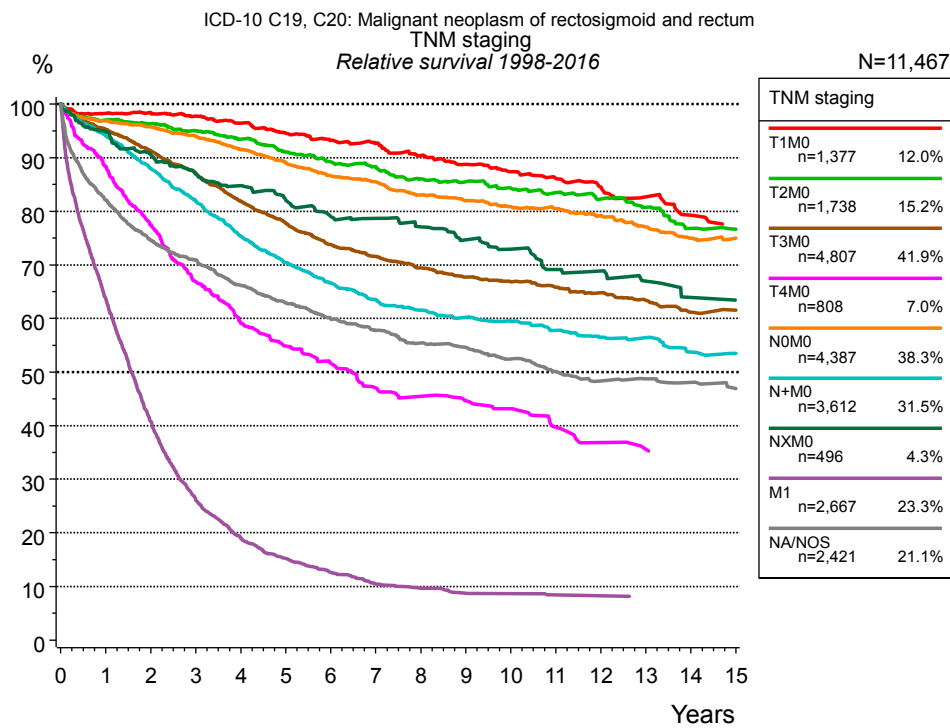


Figure 4i. Relative survival of patients with rectal cancer by TNM staging. For 13,155 of 13,888 cases diagnosed between 1998 and 2016 valid data could be obtained for this item. For a total of 11,467 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 2,421 patients with missing values regarding TNM staging (17.4 % of 13,888 patients, the percent values of all other categories are related to n=11,467).

Years	TNM staging													
	T1M0 n=1,377		T2M0 n=1,738		T3M0 n=4,807		T4M0 n=808		NOM0 n=4,387		N+M0 n=3,612		NXM0 n=496	
	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	95.9	98.3	94.1	97.0	92.6	95.3	85.8	88.4	94.0	96.9	91.7	94.1	92.2	95.0
2	93.6	98.4	90.6	96.3	86.3	91.3	73.1	77.4	90.3	95.8	83.7	88.0	85.4	90.6
3	90.5	97.7	86.8	95.0	80.1	87.0	61.7	66.9	86.0	93.9	76.1	82.0	79.7	87.0
4	86.9	96.4	82.9	93.5	73.4	81.9	53.3	59.1	81.4	91.5	68.4	75.4	75.8	84.8
5	82.9	94.5	78.4	91.1	67.8	77.8	48.2	54.9	76.9	89.1	62.4	70.4	71.3	82.1
6	79.5	93.2	74.6	89.2	62.6	73.8	44.4	51.6	72.6	86.6	57.6	66.6	67.1	79.0
7	76.7	92.7	71.6	88.3	59.1	71.6	39.3	47.0	69.5	85.5	53.6	63.5	65.0	78.7
8	72.6	90.4	67.6	86.0	55.8	69.4	37.3	45.5	65.5	83.1	50.7	61.6	62.1	77.1
9	69.0	88.7	65.1	85.5	52.8	67.7	35.6	44.7	62.6	82.0	48.4	60.3	58.3	74.7
10	65.7	87.4	62.2	84.4	50.6	66.8	33.8	43.1	59.8	80.9	46.4	59.5	55.2	72.9
11	62.6	86.1	59.6	83.5	48.4	65.9	30.1	39.7	57.6	80.5	43.9	57.8	51.1	69.1
12	59.5	84.5	56.9	82.3	46.1	64.8	27.3	36.9	54.8	79.2	41.8	56.5	49.5	68.9
13	56.0	82.7	54.0	80.8	43.6	63.4	25.9	35.6	51.4	77.1	40.6	56.4	46.3	67.0
14	52.2	79.2	49.7	76.8	40.7	61.2			48.3	75.0	37.5	53.8	43.1	64.0
15			48.1	76.7	39.5	61.6			46.6	75.0	36.2	53.5		

<i>cont'd</i>	TNM staging			
	M1 n=2,667		NA/NOS n=2,421	
	obs. %	rel. %	obs. %	rel. %
Years				
0	100.0	100.0	100.0	100.0
1	61.9	63.6	78.6	82.1
2	38.9	40.8	68.8	74.6
3	24.5	26.2	63.3	70.9
4	17.5	19.1	57.3	66.2
5	13.6	15.2	52.8	62.9
6	11.1	12.6	48.7	59.9
7	9.1	10.5	45.5	57.8
8	8.2	9.7	42.3	55.4
9	7.3	8.7	40.4	54.6
10	7.0	8.7	37.6	52.5
11	6.7	8.4	34.9	50.1
12	6.5	8.2	32.5	48.3
13			31.9	48.7
14			30.5	48.1
15			28.9	46.9

Table 4j. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by TNM staging for period 1998-2016 (N=11,467).

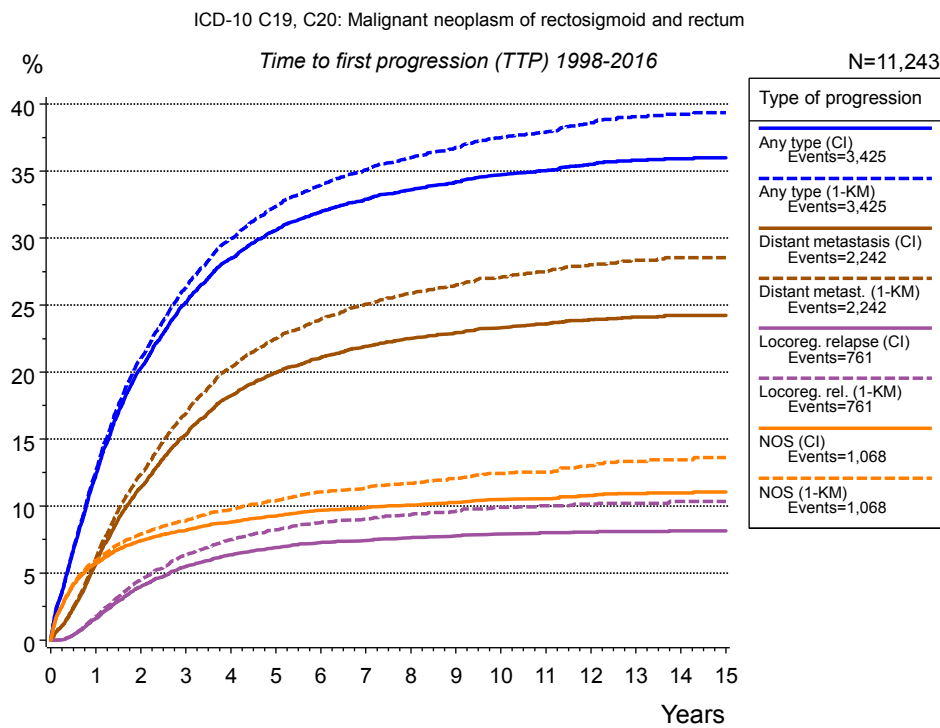


Figure 5a. Time to first progression of 11,243 patients with rectal cancer diagnosed between 1998 and 2016 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

Years	Type of progression						
	Any type (CI)	Any type (1-KM)	Distant metastasis (CI)	Distant metast. (1-KM)	Locoreg. relapse (CI)	Locoreg. rel. (1-KM)	NOS (CI)
	n=11,243 %	n=11,243 %	n=11,243 %	n=11,243 %	n=11,243 %	n=11,243 %	n=11,243 %
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	12.3	12.6	5.7	6.1	1.6	1.8	5.7
2	20.3	21.0	11.4	12.3	4.0	4.5	7.4
3	25.2	26.3	15.3	16.9	5.5	6.3	8.2
4	28.5	30.0	18.2	20.3	6.4	7.5	8.8
5	30.6	32.3	19.9	22.5	6.9	8.2	9.3
6	32.0	34.0	21.1	23.9	7.3	8.8	9.7
7	32.9	35.1	21.9	25.1	7.4	9.0	9.9
8	33.6	36.0	22.5	25.9	7.6	9.3	10.1
9	34.2	36.8	22.9	26.5	7.8	9.6	10.3
10	34.7	37.5	23.3	27.1	7.9	9.9	10.5
11	35.0	37.9	23.6	27.5	8.0	10.0	10.5
12	35.5	38.6	23.9	28.0	8.1	10.1	10.8
13	35.8	39.1	24.1	28.3	8.1	10.2	10.9
14	35.9	39.2	24.2	28.5	8.2	10.3	11.0
15	36.0	39.4	24.2	28.5	8.2	10.3	11.0

Type of progression	
<i>cont'd</i>	NOS (1-KM) n=11,243
Years	%
0	0.0
1	5.9
2	7.9
3	8.9
4	9.7
5	10.4
6	11.1
7	11.4
8	11.7
9	12.1
10	12.4
11	12.5
12	13.0
13	13.3
14	13.4
15	13.6

Table 5b. Time to first progression of patients with rectal cancer for period 1998-2016 (N=11,243).

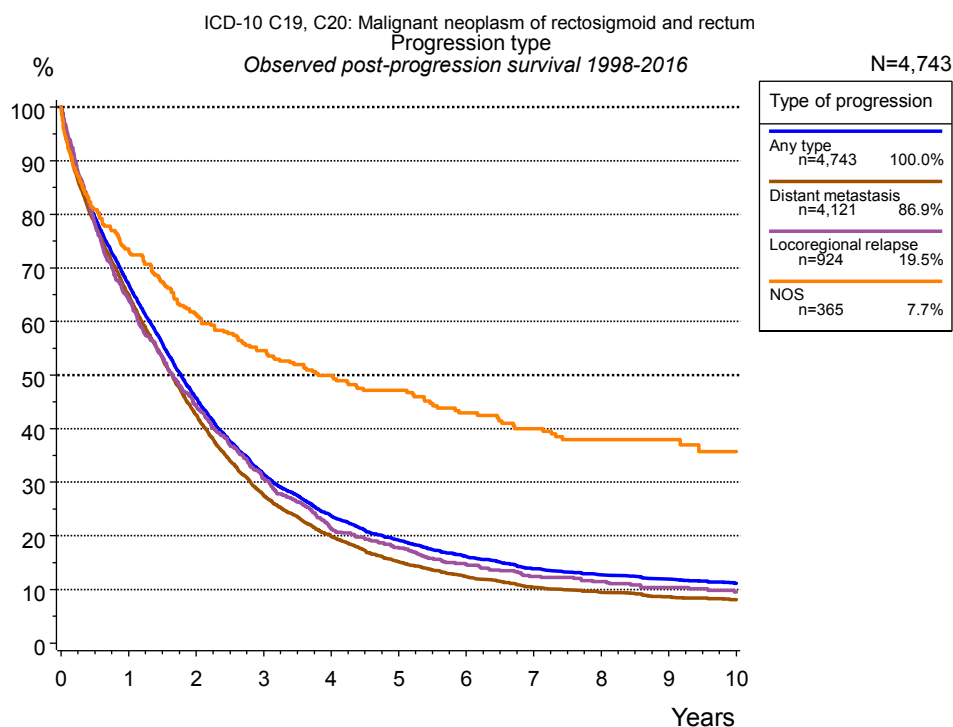


Figure 5c. Observed post-progression survival of 4,743 patients with rectal cancer diagnosed between 1998 and 2016. These 4,743 patients with documented progression events during their course of disease represent 34.2 % of the totally 13,853 evaluated cases (incl. M1, n=2,610, 18.8 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,292, 9.3 %). Multiple progression types on different sites are included in the evaluation even when not occurring synchronously. The NOS (not otherwise specified) class is included under the condition, that it is the one and only progression type during the course of disease.

Medical record documentation often lacks the linguistic severity to distinguish between local relapse, regional lymph node metastasis and distant spread in solid cancers. Frequently, the statement “not specified” is the only information in registries regarding relapse of the disease. The category “Any type” denotes all cases who suffered from at least one relapse during the course of disease (incl. primary M1-status). Although, the real number of relapsed patients is likely to be much higher. The accumulated percentage of patients with local relapse or distant metastasis exceeds the 100 % value because patients are potentially considered in more than one subgroup.

Years	Type of progression			
	Any type n=4,743 %	Distant metastasis n=4,121 %	Locoregional relapse n=924 %	NOS n=365 %
0	100.0	100.0	100.0	100.0
1	66.9	64.9	64.0	73.5
2	45.7	42.5	44.2	61.2
3	31.5	27.6	30.7	54.6
4	23.7	20.0	21.3	50.0
5	19.1	15.2	17.8	47.2
6	16.1	12.4	14.7	42.9
7	13.9	10.4	12.4	40.0
8	12.7	9.5	11.5	38.0
9	11.9	8.6	10.4	38.0
10	11.1	8.1	9.5	35.7

Table 5d. Observed post-progression survival of patients with rectal cancer for period 1998-2016 (N=4,743).

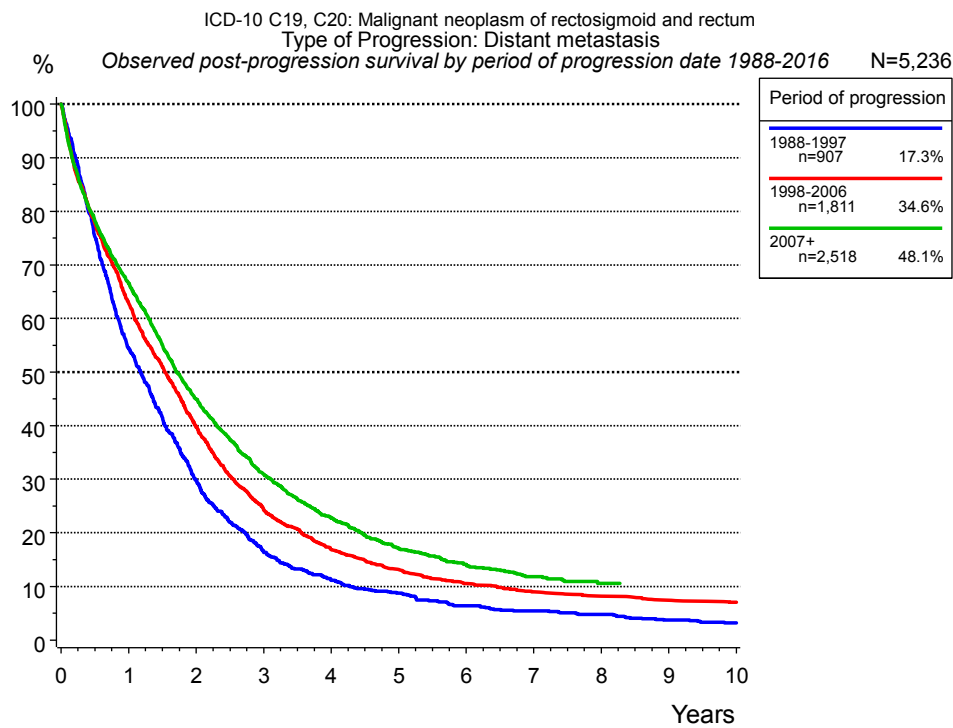


Figure 5e. Observed post-progression (distant metastasis) survival of 5,236 patients with rectal cancer diagnosed between 1988 and 2016 by period of progression.

Years	Period of progression		
	1988-1997 n=907 %	1998-2006 n=1,811 %	2007+ n=2,518 %
0	100.0	100.0	100.0
1	54.4	62.8	66.6
2	29.8	39.7	45.0
3	16.5	24.3	30.9
4	11.1	16.9	22.8
5	8.8	13.1	17.1
6	6.4	10.5	14.0
7	5.4	9.0	11.8
8	4.8	8.1	10.6
9	3.7	7.4	
10	3.2	7.0	

Table 5f. Observed post-progression (distant metastasis) survival of patients with rectal cancer for period 1988-2016 by period of progression (N=5,236).

Shortcuts

MCR	Munich Cancer Registry, Germany	
NCI	National Cancer Institute, USA	
SEER	Surveillance, Epidemiology, and End Results, USA	
UICC	Union for International Cancer Control, Geneva	
DCO	Death certificate only	Death certificate provides the only notification to the registry.
NA	Not available	
NOS	Not otherwise specified	
OS	Overall/Observed survival	Overall/Observed survival (Kaplan-Meier estimate) Date of entry: diagnosis Event: death from any cause
RS	Relative survival	Survival compared to “general population”, ratio of observed to expected survival (Ederer II method), reflecting cancer specific survival
AS	Assembled survival	Assembled chart of observed, expected, relative survival
CS	Conditional survival	Survival probability under the condition of surviving a given period of time
TTP	Time to progression	Time to first progression / relapse Date of entry: diagnosis Event: (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression
1-KM		1 minus Kaplan-Meier estimator ("inverse" Kaplan-Meier estimator)
CI		Cumulative incidence Death as competing risk (according to Kalbfleisch und Prentice)
PPS	Post-progression survival	Survival since first progression / relapse (Kaplan-Meier estimate) Date of entry (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression Event: death from any cause

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